



## Putting Research to Work

WisDOT RD&T E-Newsletter, August 2005

Technical information for state DOT highway professionals

Prepared by CTC & Associates LLC

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## Designing for the Future

### WisDOT Bridge Redesign Protects Threatened Snake

An ongoing expansion of WIS 164 in Waukesha County includes several design elements to help keep the Butler's garter snake, a threatened species in Wisconsin, off the road. Engineers added 8 feet of width to a bridge over the Pewaukee River to allow for a dry passage along the river under the bridge. Other project additions designed to minimize habitat fragmentation include two box culvert "ecopassages" with special grading, native topsoil fill and grates for light to encourage the snakes to pass under the road. Read the article in *Western Builder* at <http://www.acppubs.com/article/CA609871.html>, and see the project Web site at <http://www.dot.wisconsin.gov/projects/d2/wis164/index.htm>.

### Landscaped Slope Replaces Dangerous Rock Wall in Connecticut

Connecticut DOT is removing a rock wall that marks the end of the Route 7 connector, a high-speed, limited-access highway. The wall has been the site of numerous accidents, including fatalities. A landscaped slope similar to a runaway truck ramp will replace the rock wall, extending 40 to 50 feet back from the intersection. See the article in *The Hour* at <http://www.thehour.com/328702047687321.bsp>, and read more at [http://www.nycroads.com/roads/US-7\\_CT/](http://www.nycroads.com/roads/US-7_CT/) (scroll to the gray bar).

### Engineering Feats Abound in Monumental Bridge Project

Built to withstand hurricanes and earthquakes, South Carolina's new Cooper River Bridge is North America's longest cable-stayed bridge and a new state landmark. In addition to the visually impressive design, notable features include rock islands constructed on the riverbed to protect the bridge's piers from errant shipping vessels, and a bicycle/pedestrian lane with observation points, added after community input. Read more in *Southeast Construction* at [http://www.southeastconstruction.com/features/archive/0507\\_cover.asp](http://www.southeastconstruction.com/features/archive/0507_cover.asp), and see the project Web site at <http://www.cooperriverbridge.org/>.

### SCDOT Mitigation Bank Conserves Island, Saves Money

South Carolina DOT is leading a public-private partnership in its Sandy Island Mitigation Bank that will permanently protect an entire ecosystem, archeological sites and island communities. SCDOT recently won a conservation award for the creation of the bank, which preserved high-quality wetlands while reducing construction costs for other projects. Mitigation bank credits saved \$53 million that would have been needed to bridge marginal wetlands in other areas. See the press release at [http://www.scdot.org/ArtMan/publish/article\\_363.shtml](http://www.scdot.org/ArtMan/publish/article_363.shtml), and read more on the FHWA Web site at [http://www.fhwa.dot.gov/environment/greenerroadsides/sum01\\_3.htm](http://www.fhwa.dot.gov/environment/greenerroadsides/sum01_3.htm) and in AASHTO's *Taking the High Road* at <http://downloads.transportation.org/highroad/HighRoad-08.pdf> (see page 2).

### Bridge Realignment Cuts Construction Costs, Preserves Battlefield

The discovery of a long-lost Revolutionary War battlefield during a bridge replacement threatened to delay South Carolina DOT's progress on the project. So SCDOT and FHWA came up with an alternative: purchase the battlefield and adjoining land, deeding the battlefield to the state DNR for preservation and moving the bridge 45 feet onto the adjoining land. The change in plans will save taxpayers more than \$1.5 million, as the move will be cheaper than excavating the battlefield. Read the press release at [http://www.scdot.org/ArtMan/publish/article\\_373.shtml](http://www.scdot.org/ArtMan/publish/article_373.shtml), and read more in South Carolina's *The State* at <http://www.thestate.com/mld/thestate/11835029.htm>.

# Construction and Materials Innovations

## **Superpave Handles Super Loads in California**

A recent look at the Alameda corridor in southern California, on which dense truck traffic deals with heavy loads from shipping docks, found deep Superpave working well at resisting rutting and fatigue. The roadway employs 20 inches of Superpave mix over 4 inches of aggregate. Read more in *Asphalt Magazine* at

[http://www.asphaltinstitute.org/Upload/Alameda\\_Project\\_Exceeds\\_Expectations\\_995791427\\_7212005084914.pdf](http://www.asphaltinstitute.org/Upload/Alameda_Project_Exceeds_Expectations_995791427_7212005084914.pdf).

## **Texas Goes Prefab with Interchange Bridges**

In what could be a harbinger of a trend to come, Texas is attempting its first prefabricated bridge project with freeway-highway interchange bridges. Prefabrication is typically used with smaller bridges, rather than very large elements requiring 200-ton cranes to install. The project will be complete in 2007. See the KCEN-TV article and video clip at <http://www.kcentv.com/news/c-article.php?cid=1&nid=7561>.

## **Ultra-High-Performance Concrete Making U.S. Debut**

The Center for Transportation Research and Education at Iowa State University is working with FHWA and an Iowa county to build an ultra-high-performance concrete bridge, apparently the first of its kind in the country. Used in highway bridges in France, UHPC uses small aggregate in concrete mix along with 2% steel fiber, and often includes sand, quartz, silica fume and other materials. FHWA has been studying UHPC since about 2002; see

<http://www.fhrc.gov/focus/nov04/01.htm>. Read more in CTRE's Tech News newsletter at [http://www.ctre.iastate.edu/pubs/Tech\\_News/2005/may-jun/wapello\\_bridge.htm](http://www.ctre.iastate.edu/pubs/Tech_News/2005/may-jun/wapello_bridge.htm).

## **San Francisco Bridge Uses Integral Concrete Bent Caps**

Engineers of a new continuous steel girder bridge in San Francisco optimized vertical space beneath the deck by using integral concrete caps. Contractors run a cable through the girders within the cap, which they then tension for full support. See the article in *Steel Bridge News* at <http://www.aisc.org/Content/ContentGroups/Documents/NSBA5/July05.pdf>.

## **Use of Quiet Pavement Growing**

The Asphalt Institute predicts open-graded friction courses for skid resistance and quiet driving will become increasingly common as successful installations continue to mount. Citing success in Europe, Arizona and California, the piece notes that national research initiatives will parallel continued use. See the article in *Asphalt Magazine* at

[http://www.asphaltinstitute.org/Upload/Quiet\\_Pavement\\_Coming\\_To\\_Highway\\_Near\\_You\\_995791427\\_721200508573.pdf](http://www.asphaltinstitute.org/Upload/Quiet_Pavement_Coming_To_Highway_Near_You_995791427_721200508573.pdf).

## Operating/Optimizing the System

### Superheroes Help TxDOT Fight Litter

Texas DOT is turning to a cast of animated characters to get out its anti-litter message. The superheroes began their efforts in mid-July, aiming their powers at elementary-school children. Since research shows that Texans ages 16 to 24 are the state's worst litter offenders, TxDOT hopes the cast of superheroes will help prevent a bad habit from starting. Read the press release at [http://www.dontmesswithtexas.org/news\\_detail.php?news\\_id=34](http://www.dontmesswithtexas.org/news_detail.php?news_id=34).

### SCDOT Pumps Motorists Up

South Carolina DOT recently opened its first "Inflation Station" at an Interstate 26 welcome center. SCDOT hopes the free service will keep roadways safer by reducing crashes caused by tire blowouts and improper maintenance. The station features a heavy-duty air compressor for supplying air to passenger car and light truck tires, as well as instructional materials in both English and Spanish that demonstrate the correct way to fill tires. Read the press release at [http://www.scdot.org/ArtMan/publish/article\\_376.shtml](http://www.scdot.org/ArtMan/publish/article_376.shtml).

### Public-Private Effort Spruces Up Right-of-Way, Saves VDOT Money

Dissatisfied with the lack of landscaping along the highway leading to their city, residents of Lynchburg, Va., took matters into their own hands. They solicited sponsors to donate money—nearly \$1.5 million in all—in exchange for acknowledgement signs along the expressway, then used the money to improve 4.5 miles of highway right-of-way. The city of Lynchburg agreed to maintain the improvements, at a cost of about \$325,000 annually. Legislation authorizing similar projects across the state passed last year. See the article in Virginia DOT's Bulletin newsletter at <http://www.virginiadot.org/bulletin/2005MayJun/Best%20Practices.asp>.

### GPS for Monitoring Bridges' Structural Health

Researchers at the University of Nottingham in Britain are using GPS receivers to study how bridges' movements are affected by heavy traffic and environmental factors such as wind. The methods in the study could lead to a more permanent monitoring system to assess changes in bridges' performance over time, helping engineers determine whether maintenance is needed. See the press release at [http://www.nottingham.ac.uk/public-affairs/press-releases/index.phtml?menu=pressreleases&code=LAT-103/05&create\\_date=23-jun-2005](http://www.nottingham.ac.uk/public-affairs/press-releases/index.phtml?menu=pressreleases&code=LAT-103/05&create_date=23-jun-2005).

## Safe Travel/Smart Travel

### Wisconsin Traffic Crash Facts

Released in July, the 2004 Wisconsin Traffic Crash Facts book provides statewide information on traffic crashes and their human consequences, helps identify current and emerging traffic safety issues, and serves as a resource for Wisconsin traffic safety professionals. View the report at <http://www.dot.wisconsin.gov/safety/motorist/crashfacts/>.

### New Tack for Motorcycle Safety

More than 120 motorcyclists are injured annually on the roads of South Gloucestershire, U.K., due largely to driver inattentiveness. A new campaign is using the Internet and signs at accident hot spots to improve driver awareness of riders and cut the accident rate. Read the news article at [http://www.larsoa.org.uk/news\\_july05/news07\\_smidsy.htm](http://www.larsoa.org.uk/news_july05/news07_smidsy.htm), and see the campaign Web site at <http://smidsy.co.uk/>.

### ITS Across the River

A \$17 million ITS system will help shepherd drivers safely across the new Ravenel (Cooper River) Bridge in Charleston, S.C., and can warn them to use other routes when there are high winds or tie-ups. Read the article in *The State* at <http://www.thestate.com/mld/thestate/news/local/12097653.htm>, and visit the project Web site at <http://www.cooperriverbridge.org/>.

### ITS Optimizes Tunnel Traffic Flow

The Holland and Lincoln Tunnels connecting lower Manhattan to New Jersey are among the busiest in the world. To increase security, improve traffic flow, and enhance emergency response capabilities, a new ITS initiative integrates video surveillance and an automatic incident detection system. The project recently received a Project of the Year Award from ITS-NY. See the press release at [http://www.transdyn.com/news/HTLT\\_Proj\\_of\\_year.html](http://www.transdyn.com/news/HTLT_Proj_of_year.html) and read more about the project at [http://www.transdyn.com/pdf/LTHT\\_PP\\_05-16-05.pdf](http://www.transdyn.com/pdf/LTHT_PP_05-16-05.pdf).

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Other e-newsletters for transportation professionals:

**TRB E-Newsletter** from the Transportation Research Board: <http://gulliver.trb.org/news/>.

**The AASHTO Journal** from the American Association of State Highway and Transportation Officials: <http://www.transportation.org/publications/journal.nsf>.

**CTS Research E-News** from the University of Minnesota: <http://www.cts.umn.edu/publications/enews/>.

**Texas Transportation Researcher** from TAMU's Texas Transportation Institute: <http://tti.tamu.edu/researcher/>.

**Minnesota DOT Research Newsletter**: <http://www.research.dot.state.mn.us/newsletter.cfm>

**Austroads Newsletter** from Austroads: [http://www.austroads.com.au/austroads\\_newsletter.html](http://www.austroads.com.au/austroads_newsletter.html).

**Transportation Communications Newsletter**: <http://groups.yahoo.com/group/transport-communications/>.